Chapter 3

CHANGES NEEDED IN THE TEACHING OF AGRICULTURAL EXTENSION EDUCATION

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Through the globalization and industrialization our society is changing rapidly, therefore also agriculture is changing and agricultural extension and the teaching of extension education has to change. Let me mention some of the changes I have observed in agriculture and in agrikicultural extension and than discuss the implications of these changes for the teaching of extension education.

About 30 years ago I went for holiday to Mahabalipuram at the beach South of Chennai. At that time there was much discussion on the impact of the introduction of the high yielding varieties on farm income. So I asked a farmer in that area whether he used these varieties and how this has changed his income. He said that through the use of these rice varieties he had increased his income about five fold. He was grateful to the government Village Extension Worker who had taught him which varieties togrow, how much and which fertilizers to use, how to irrigate, etc. Also the government had realized that a successful use of these varieties required a good irrigation system and therefore they had improved the irrigation system in his area. Other farmers in his village had a similar experience. Clearly here the successful transfer of technologies by the extension service has helped farmers to increase their income. It had also been useful for the country as whole, because it made it possible to meet the growing demand for rice for the growing population.

A few weeks ago I went for holiday to the touristic island Bali in Indonesia. There I was offered the opportunity to join a study tour of farmers from a neighboring island to study the development of vegetable production on Bali. We visited a farmer who had inherited 2 ha of land from his father, who was a rice farmer. Our host was no longer growing rice, but instead 25 different kinds of vegetables and in addition more than 1000 orchids, which he rented to hotels. I asked him how he had learned how to grow these vegetables. He tried to use all available sources of information. This included the experience of farmers who were already growing this vegetable, the commercial company which sold him the seed and was interested that their customers make a profit and hence would buy more seed next year. Also the company marketing his product was interested to give him useful information. Some of the information he got from the government extension service or from the Belgian NGO which organized this study tour. He found information on the Internet, from publications and staff members of the local university and even the University of Tokyo. Using this information he calculated what the production would be if he cultivated this vegetable and what the cost of production would be. Than he negotiated with traders for which price they were willing to buy his product. That made it possible to decide which combination of vegetables would give the highest profit with the lowest risk.

The farmer realized that the vegetable market was changing and that through cooperating with other growers he could get more power in the market and may become an attractive partner for interesting customers, e.g. the catering firms supplying airlines.

Here the main role of the extension services and NGOs was developing entrepreneurship and supporting the development of farmers' organizations, although transfer of technologies remained important. I see similar changes in the role of extension organizations in many other countries. This requires competencies of extension officers, which they do not acquire by studying the traditional textbooks on agricultural extension.

This is also a reason why the textbook by Leeuwis with

van den Ban (2004) is very different from the van den Ban and Hawkins (1996) book.

Changing goals and target groups of agricultural extension services

In many developing countries the main goal of the extension service is to help farmers to increase their crop yields per ha and the production per animal by using improved production technologies. This approach has contributed much to the success of the Green Revolution and with the growing demand for food as the result of growing population it remains an important goal. However, in the present era with economic growth and globalization one realizes that also other extension goals become important:

1. In the ATMA project there is much attention for the need to help farmers to change their farming system towards the production of high value horticultural and animal products for which the demand increases with increasing prosperity and globalization. E.g. in the last 30 years the annual consumption of meat per capita in China has increased form 20 to 50 kg (World Bank, 2007b). This change does not only require a change in production technology, but also a change in extension approach, because production of these high value products often involves more risks and not only a change at the farm level, but also a change in the in the whole value chain from the producers of agricultural inputs to the consumers of agricultural products and in the access to (micro)credit. There excellent discussions of these changes (e.g. Singh, Swanson and Singh, 2006, World Bank 2007a, Neuchatel Group, 2008). Therefore it is not necessary to discuss these changes here again.
2. Over half of the world's extreme poor people depend for their livelihoods mainly on farming and farm labour (IFAD, 2001, p.2). In many countries a major goal of government policy is to reduce their poverty. Agricultural development has to play an important role in this policy. We can expect more impact from increasing labour productivity on farm income than

from increasing yields. Irz et al. (2001) have shown that both land productivity and labour productivity are related to the incidence of poverty, but the relationship with labour productivity is much stronger. Also the potential to increase labour productivity is much larger than the potential to increase yields. The agriculture value added per worker is in India 6 times higher than in some of the poorest countries/ but there are several countries were this value is more than 100 times as high than in India (World Bank 2007b, p. 320). As long as we do not succeed in decreasing this large gap in labour productivity most Indian farm families will remain poor. The Summary for Decision Makers of the International Assessment of Agricultural Knowledge, Science arid Technology (IAAST) Report for East Asia and the Pacific says (p.9,10) "In developed countries such as Japan and South Korea, high standards of living have made many aspects of agriculture unviable. Governments in these countries and others in Asia have made the transition from small-scale agriculture to non-farm employment a priority. Yet, given the poor educational levels and training of rural populations, particularly women, the transition has not met the needs of most agricultural producers for alternative decent livelihoods". In my opinion the major problem to which agricultural extension in India has not given enough attention so far is realizing the potential to decrease this gap in labour productivity and helping members of farm families to find non-farm employment. Also the Global Report of the IAAST gives unfortunately limited attention to the potential and the need to increase labour productivity in agriculture.

3. Increasing the labour productivity in agriculture implies that with less people working in agriculture enough food can be produced for the population. It is quite clear that with increasing prosperity the proportion of the labour force with can find

employment in agriculture decreases (Clark, 1957). The consumption of food per capita will increase less than e.g. the money which is spend on electronic products. Many farm families realize this and seek for themselves or for their children full-time or part-time off-farm employment. With the increasing number of cars and motorcycles the employment opportunities e.g. as a mechanic increases more than the on-farm employment opportunities. However, many of these non-farm employment opportunities require special skills, which are difficult to acquire in India villages. In 1991 55% of the rural labour force in India was illiterate, and only 10% in the Philippines. In addition the labour market of ten requires vocational skills for which no training is offered in rural schools (See also World Bank 2007b, Ch.9).

The decision whether or not to look for off-farm employment for farmers or for some of their family members has important implications for the welfare of the farm family, also because this may imply that they may have to leave the village, where their relatives and friends live. In the Netherlands the extension services of the farmers unions have given advise to help farm families to make this decision, but Indian farm families have very limited possibilities to get this kind of help.

4. With the rapid economic change in the present era the managerial ability and entrepreneurial competence has much impact on the success in farming. The farmer on Bali mentioned earlier made a good income, because these abilities enabled him to profit from the new opportunities in the market. Developing entrepreneurship among the farmers is now an important role of an agricultural extension service, but how many of the extension agents are well trained to perform this role? Extension agents who are well trained to perform this role can enable their farmers to compete in the market with farmers in other countries. E.g. in the Netherlands the supply of

mangoes has increased a lot in the past decade, but very few of these mangoes come from in India, whereas in India a lot of good mangoes are produced. Which university does research to discover why the Brazilians are more successful in this market than the Indians?

5. For extension on production technologies the support to extension agents by researchers is pretty well organized, but for extension on the marketing of agricultural products and on value addition it is difficult for extension agents to get from researchers the support they and their farmers need'. For a farmer it is important to predict well in advance the price he can make for his products. This price can change as a result of change in the supply of the product, in the preferences of consumers and in government policies. These last kind of changes are most difficult to predict. During the last 20 years in the European Union the producer price support as a percentage of gross farm receipts decreased form 40% to about 25% (The Economist 25-7-2009). A reason is that with decreasing proportion of the population working in agriculture the power of farmers in politics decreased. The rapid changes in food and oil prices during the last year showed that the ability of experts to predict these changes is still limited.

6. The Netherlands is a country of about the same size as Haryana, but he value of Dutch agricultural exports is larger than this value for all other countries except the USA. Which agricultural university can teach its students how the Dutch got such a large share of the world market and what Indians can learn from this experience?

7. Many people worry that present fanning systems are not sustainable, but cause serious environmental problerrfe through soil erosion, soil salinity, pollution, loss of biodiversity etc. A good discussion of these issues is the Report on International Assessment of Agricultural Knowledge, Science and Technology for

Development, Ch. 6, which is written by some 400 agricultural experts from all over the world. Changing towards more sustainable farming systems will require major efforts from extension to make people aware of the causes and possible solutions for non-sustainable ways of farming. This requires a different kind of extension than the traditional kind with was aiming at changing individual decision making, whereas many of the present problems can only be solved through collective decision making. That can be decision making by a group of farmers, who are willing to reduce soil erosion, but also formulating and implementing government rules on pollution control. In short run products produced in a sustainable way can be more expensive than those produced in the conventional way. Can we help consumers to distinguish between these two kinds of products and are they willing to pay the higher price which is needed to produce sustainable products profitably? There maybe conflicts of interests between different actors involved in this production and commercialization. Can we negotiate for finding a solution which is in the best interest of all involved?

. Researchers are often rewarded for publishing articles in disciplinarian journals, whereas a farmer should have an holistic view of the problems on his farm integrating knowledge from different disciplines, from his own experience and the experience of his colleagues and information about markets and his own situation and resources. It is a task of the extension agent to bridge the gap between these different ways of thinking. He can only succeed in doing so if he understands the way of thinking of the scientists as well of the farmers. In many universities he is only taught to understand scientists but not to understand farmers. Personally I aril happy that as a student I had to live and to work on 4 different farms, because this helped me not only to understand these farmers, but also other farmers in other countries

9. The IAAST says in its Summary for Decision Makers of the East and South Asia and Pacific Report (p.10): "The feminization of agriculture in most of the ESAP region means that women comprise the majority of the continuing rural poor. But despite the opportunities gained from growing markets, the benefits that accrue to women depend on their level of knowledge and access to assets and resources". This is a very serious problem for India because in this country in 1991 69% of the rural women was illiterate against only 10% of the rural women in Thailand (IFAD, 2001, p.37). In both countries this percentage has decreased during the last 20 years. When I come at a staff meeting of village extension agents in Thailand or the Philippines often more than half of the agents are women, whereas the .proportion of female village extension agents in India is much smaller. For cultural reasons it is India more difficult for a male agent to approach a female farmer than in these countries. Should the feminization of Indian agriculture be followed by a feminization of the extension service?
10. Indian farmers are competing increasingly in global markets with farmers from other countries, who like to sell their products in the same markets or even in India. The most serious competitor in the market for tropical agricultural products is Brazil, which realized a successful agricultural development in recent years. Between 1990 and 2005 the annual growth in agricultural value added was in Brazil 4.1% and in India 2.5%. To be able to compete in these markets it is important that the actors in agricultural development in India know how the Brazilians realized this success. Who in India tries to keep up-to-date with this development, e.g. by studying or working some time in Brazil or by reading their journals which are published in Portuguese?

The process of rapid industrialization started in South Korea some 30 years earlier than in India. Knowledge of the

impact of this process on agricultural development in South Korea can help to predict what will be the impact of the present industrialization in India on agricultural development. In South Korea few young people raised on a farm entered farming because they considered off-farm employment and often life outside their village more attractive. Therefore many of the farmers are now over 60 years old and they know that none of their children is interested to take over the farm. They do not expect that the extension service will help them to become a better entrepreneur who is well able to compete in the market. What will become the role of the extension service if the Indian society changes in a similar way?

Agricultural innovations

Roling (2009) has recently published an analysis of 5 different pathways for agricultural innovations:

1. Technology supply push as we have seen in. the green revolution with diffusion of innovations developed in agricultural research institutes.
2. Farmer-driven innovation. There are many more farmers than agricultural researchers and hence all farmers together have more brains than the researchers. They use these brains for developing innovations and testing whether or not these innovations work well in their environment. In this way often more valuable agricultural innovations are developed than in research institutes.
3. Participatory technology development. Increasingly researchers work together with farmers to develop innovations which provide a solution for problems these farmers face.
4. Market-propelled or induced innovation. Agricultural innovations often result in an increased production. This will increase the income of the first farmers who adopt these innovations, but also in lower prices for agricultural products and therefore in lower incomes for the farmers who have not yet adopted these innovations. They can react in two ways: adopting

these innovations also and therefore lowering the prices even more or leaving agriculture. But in many environments there is no alternative employment for them.

5. Changing innovation systems, that are the rules of the game that reduce uncertainty in human interaction. These new innovation systems are often a requirement for the successful adoption of agricultural innovations/ but changing human interaction e.g. through building new organizations, is more difficult to realize than developing technological innovations.

Indian agricultural universities should analyze what are the potentials and the consequences of working along each of these pathways in their environment. Otherwise the innovations they help to develop may have consequences they do not desire.

A team of researchers from the World Bank, India and elsewhere studied how agricultural innovation can be enhanced (World Bank 2007a, ch.7).. They concluded that new ways of enabling innovation are required to deliver economic growth and reduce poverty. They came to nine findings on the nature of successful innovation systems:

1. Research is an important component - but not always the central component - of innovation.
2. In the contemporary agricultural sector, competitiveness depends on collaboration for innovation.
3. Social and environmental sustainability are integral to economic success and need to be reflected in interventions.
4. The market is not sufficient to promote interaction; the public sector has a central role to play.
5. Interventions are essential for building the capacity and fostering the learning that enables the sector to respond to competitive challenges.
6. The organization of rural stakeholders is a central development concept. It is a common theme in innovations systems and in numerous agricultural and rural development efforts.

7. Actors that are critical for coordinating innovation at the sector level are either overlooked or missing.
8. A wide set of attitudes and practices must be cultivated to foster a culture of innovation.
9. The enabling environment is an important component of innovation capacity.

Competencies required for successful agricultural extension.

To be successful an agricultural extension agents need different kinds of knowledge, including knowledge from agricultural research in different disciplines, from farmers' experience and experiments, their resources and their goals, about developments in the markets and the way to built successful farmers' organizations. It is a challenge to integrate all these different kinds of knowledge. E.g. research findings may suggest what is a good decision for a resource rich farmer, but which is at the same time a poor decision for a resource poor farmer, who becomes more depended on a money lender when he takes this decision.

The extension agent needs also knowledge on how to communicate effectively with his farmers and how to organize an effective extension program.

At the occasion of its 90st anniversary Wageningen University and Research Centre published a book "Science for Impact" in which the Rector Magnificus, Martin Kropff, wrote: "The complexity of societal issues and the fact that social, economic, cultural and technological developments, intertwine demands ....striving for a closer interaction between natural and social sciences. Such a broad view and interdisciplinary approach towards science is characteristic of the Wageningen UR approach. ...Technology alone cannot gain acceptance for research results or solutions to problems: socio-cultural and socio-economic aspects must be and are taken into consideration.... We call this concept co-innovation - striving for interaction between science and society". (Kropff and Kalwij, 2008, pp. 12-14) I am convinced that institutional innovations are often more important for agricultural development than technological innovations and that both kinds of innovations often have to be combined to be successful.

Do you and your university agree with these opinions? Why or why not?

Within Wageningen University a consequence of this approach is that many staff members and students are convinced them that their study enables them to contribute to the development of a solution for an important problem in our society; this motivates them in their work.

One way to realize the cooperation between natural and social scientists is to have for a Ph.D. thesis one supervisor from both sides: An example is the thesis of Elske van de Fliert (1993) on farmer field schools, which was supervised by the Professor of Ecological Phytopathology, Zadoks, and the Professor of Extension Education, Roling. This kind of cooperation requires that both supervisors are willing to learn from the way of thinking of the other supervisor. Simulation models of crop and animal production play an important role in the process of integrating knowledge from different disciplines.

One of my graduates got a job as a breeder of floating rice at the IRRI after he first earned a Ph.D. in genetics at University of California in Davis. He told me that in order to do his work effectively he did not only need the knowledge on rice breeding techniques he had learned from his professors, but also the knowledge which Bangladeshi farmers were willing to teach him on the reasons why they did not use the same rice variety' for all their fields, but different varieties for low laying fields and for fields which were flooded less deeply when the water table in the rivers was high. He is also convinced that recommendations to farmers on which variety to use should not be based on the results on the experiment station, but on the'experience of farmers in their own fields.

This knowledge from farmers' experience is vedry important to develop technologies which are suitable for a specific location and for new farming systems which are adjusted to the new situation in the market. .On these kind of issues farmers learn more from their own experience and the experience of successful colleagues than by listening to people who are well informed about research findings. . _

Farmers' experience is also quite important for building

' successful farmers' organizations';, which require competent leaders, who work in the interest of the group and not only in their personal interests. A good discussion of the successful cooperation between farmers and agricultural scientists provides a book based on the experience in the Poverty Elimination Through Rice Research Assistance Project in which the UK Department for International Development cooperated with the Bangladesh Rice Research Institute and the IRRI (Van Mele et al, 2005) A strength of this project was its strong commitment on learning by doing. That is a more effective way of learning than learning by listening to specialists. I am convinced that it would be in the interest of Indian farmers if this book is widely used for teaching agricultural extension at Indian Agricultural Universities.

Extension agents should learn how to develop an effective communication strategy to bridge the gap between researchers and farmers. Such a strategy should be based on information on what the farmers know, what they do not know and what they like to know. The best discussion of this strategy I know is published in India by Singhal and Rogers (2003). In their book this strategy was used for "Combating AIDS", but students in agriculture should discover how it can be adjusted to situations in agricultural development. The development of mobile telephones, computers and other kinds of ICT makes now a very different strategy possible and desirable as was possible only 10 years, ago. The extension organization should enable its staff members to keep up-to-date with and use these possibilities.

The farmers an extension agent supports differ in their resources, their knowledge, the knowledge for which they feel a need and their goals. The goals of a farmer, who has no child, who is interested to become a farmer and who expects that at his age he will stop farming in 10 years time, are very different from those of young farmer who sees good opportunities in the changing markets in farming by a real entrepreneur. The extension agent should be able to adjust his approach to these differences among his farmers

In order to improve the quality of research and teaching at East African agricultural universities the Rockefeller

Foundation enabled staff members of these universities to study for a Ph.D. at Wageningen University in the Netherlands. At a meeting to introduce this program a facilitator asked the question: "Looking back into your personal background, organization and the critical problems you face in your country, what would your Ph.D. change?" This question was a challenge to one of the participants, Paid Kibwika of Makerere University in Uganda. Therefore he played an active role in a committee which tries to introduce innovations in this university which are in the interest of their farmers and his thesis was on learning from this process of change. He discussed the key competencies with the staff members should have to realize successful change:

- Facilitate active learning processes with farmers, to enhance experimentation and joint discovery by farmers and university staff members,
- Serve as information and knowledge brokers. It is about thinking who have knowledge and information and knowing who need this and bringing them together,
- Develop local organizations and facilitate farmer empowerment processes.
- Apply system-wide perspectives in program design, implementation and impact assessments.
- Develop and promote teamwork, and be a good team player themselves.
- Facilitate development and manage partnerships for collective action.
- Support enterprise development. (Kibwika, 2006:102,103)

To what extent do Indian agricultural universities stimulate the development of these kind of competencies among their staff members and their students? To what extent should they do this?

Private and cooperative companies play in India a larger role in the value chain from the producers of agricultural inputs to the consumers of farm products than in Uganda. Therefore the need for these kind of competencies may be in India somewhat different from those in Uganda. In India much new

knowledge on agricultural production is developed by researchers in commercial companies, but government extension services make limited use of this knowledge (Sulaiman and Hall, 2004). Their Policy Brief discusses also other important changes in agricultural extension in India.

In this era of globalization we live increasingly in a multicultural world. "The basic skill for surviving in a multicultural world... is understanding first one's own cultural values (an that is why one needs a cultural identity of one's own), and next the cultural values of others with whom one has to cooperate". (Hofstede, 1991: 238). How do Indian agricultural universities help their students to acquire this skill? Hofstede found that the value in which Indian tend to differ most from people raised in other many cultures is the "power distance", that is the extent to which the less powerful members of institutions and organizations expect and accept that the power is distributed unequally (pp. 26, 262).

The main role of the agricultural extension service is no longer to transfer technologies develop by scientists to farmers. It becomes helping farmers to realize their goals by using knowledge which is applicable in their situation. That requires that they cooperate with others who have have this knowledge or are willing and able to develop this knowledge. This can be other farmers as well as many other actors. Therefore extension agents should be competent to stimulate this process of cooperation (Wielinga and Vrolijk, 2009).

Changing teaching methods

Students are prepared in the university for working in a society with is changing and will continue to change. It is not possible to teach them now how to solve the problems they will face in the middle of their career, perhaps 20 years from now. We know that these problems are quite different from the present day problems, but not what they will be.

There are two solutions for this problem. One is to increase the capability and motivation of the students for life-long learning. One way a teacher can do this is by showing his students that he tries to remain up-to-date through life-long learmn$_{g/}$e.g. for writing this chapter I had to study the Ph D

thesis of Kibwika. Through the development of the Internet it is now easier for you to follow this approach than it was 10 years ago. Nearly all readers of this book can get access to this thesis at the Internet, whereas in the past in India it was difficult to get access to foreign publications. The problem is now much more how to spend your time in an efficient way by reading only those publications which are really important for finding a solution to your problem. It is important that the teachers show their students that they try to keep up-to-date with new developments in their profession to be able to provide good quality teaching. Educational institutions should support this process of life-long learning, not only among agricultural extension agents, but also among .farmers (Rivera and Alex, 2008).

The second solution is learning a problem solving methodology, which can applied on a much wider range of problems than a solution which has worked well in the past for a similar problem. A problem I have with the work of some Indian extension scientists is that they do another study on the diffusion of innovations, which can add very little new information to the many studies which have already been done on this topic, instead of e.g. a study on how farmers do make use of new opportunities in the market.

An extension agent will gain the confidence of his farmers, if he provides them with knowledge and information for which they feel a need rather than with the knowledge scientists think these farmers should have. An extension teacher can preach that his students should apply this approach, but he can also use this approach in his own relations with his students. These students will differ in the kind of problems they hope to be able to help solving in their career. These problems can be quite different for a student who combines a course on extension education with a course on plant breeding, animal nutrition or soil erosion control. It is important that the student experiences in their course in extension education that extension is important to solve problems in his field of specialization. The teacher will not be able in his extension course to discuss in depth how extension can be used in all fields of specialization of his students, but he can help them to discover this

themselves, e.g. by writing a paper on this subject on the basis of literature on this subject or by observing how extension theories are applied in the field in his specialization. This is at the same time an opportunity for students to learn how they can find a solution for a new problem. I asked on the exam very different questions to a student who planned to become a rice breeder than to a student who hoped to get a job with a company selling animal feed. To be able to do this you have understand the differences in goals and interests among your students. This is similar to the situation of a village extension worker, who can only be effective if he knows his farmers well and understands what are the differences in the problems for which they like to find a solution.

During a discussion with farmers an extension agent needs knowledge and information. He can get this either from his memory or from written sources or the Internet. The information which was stored in his memory during his study at the university may no longer be up-to-date or (s)he may have forgotten it partly. Therefore the other sources have often to be preferred. During an exam I try to test which students will become a good extension officer. Therefore I allowed them to take at an written exam the textbook we used in the course and any other book they like to have at hand with them, but the question asks them whether they can apply the extension theories which were discussed in the course in a realistic extension situation. They can find the answer by thinking, but not by reading the book.

Learning by doing is often more effecWe way of learning than listening to a teacher. This is certainly true in learning how to communicate more effectively with farmers. Therefore extension courses should give opportunities for this kind of learning. This can be done by role playing in which students experience how people react on the way they communicate with them. This makes it possible to analyze why misunderstanding arises and which kind of emotions are aroused by your discussion partner.

Another effective way of. learning is that the student analyzes together with farmers which kind of problems they face and what are possible solutions for this problem. Van

Mele (2005) gives many interesting illustrations of this way learning by doing to become a successful extension agent. Kibwika (2006) gives different illustrations.

Extension scientists know that evaluation can help to improve extension programs. In the same way it can help to improve extension education programs. The objective of these programs is that students learn about extension and get inspired to learn more. Students know which education programs helped them most on this way and how they helped. My experience is that asking them these kind of questions and discussing with them how it would be possible to make your teaching more effective, helps a lot to improve your teaching methods. This is now a standard procedure at Wageningen University. A problem in many universities is that teachers are awarded for scientific publications, but not for good quality teaching. At Wageningen University last year one million Euro was distributed among those departments which according to the opinion of the students offered the best quality of teaching. Of this amount 90 000 Euro went to the Department of Communication and Innovation Studies, which was previously called Extension Education. The culture in this Department is that you can not help students to become a good extension officer unless you try to be a good teacher yourself.

Another way to evaluate teaching in.extension is to ask the graduates sometime after they got a job what knowledge and skills which they learned at the university are now really useful in their work and which knowledge and skills they now need were not taught at the university. It is not only important to ask the graduates these questions, but also their supervisors, who are also able to compare the-performance of graduates majoring in extension with other graduates. What is the reason to select different kinds of graduates for the job? (Sulaiman and van den Ban, 2000).

In Indian universities one is inclined to appoint only graduates in extension education as staff members of Departments of Extension Education. In other countries one sees Extension Education as an applied social science in which good work can be done by graduates from other social science disciplines, who are motivated to apply their discipline for

finding solutions for extension problems. In the early years of teaching extension education at Indian Agricultural Universities Pareek and Mulay showed that these people could do good work in developing extension as a discipline. The Department of Communication and Innovation Studies in Wageningen employs also psychologists, anthropologists, communication scientists and a health educator. At the same time it could also be useful for students to follow courses in other social science at other universities. There are e.g. job opportunities in agricultural journalism, but if there is no Department of Journalism at your university, but only at a nearby university why should you not allow a student in extension education to follow a course in that Department in order to enable her to improve the quality of a farm paper or a TV program on agriculture? Again cooperation among different disciplines can be in the interest of farmers.

Conclusions

The objective of agricultural extension is no longer only to transfer technologies from researchers to farmers to enable them to increase the yields of their crops and animals. It is also reducing rural poverty by using the opportunities in the changing markets for agricultural products in the growing cities and abroad, strengthening the input supply and marketing systems and increasing the power of farmers and their organizations in these systems. In order to realize this wider range of objectives teachers should not only use the research findings obtained in government research institutes, but also all other available sources of information, including the experience of successful farmers and their organizations, of private companies and NGOs and information on the markets for agricultural products inside and outside India. Many members of farm families will only be able to achieve a decent level of living by earning also money from non-farm sources of income. They will need help from extension to discover how this is possible.

Teaching extension should not only prepare students to help to realize the present objectives of extension organizations, because the society in which they are going to work will

continue to change and hence also the objectives of extension. Teaching extension should not only transfer knowledge from teachers to students, but also offer opportunities to students to learn from farmers and from their own experience.

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